

TERM - 1 MATH
CLASS: XII
CHAPTER 4: DETERMINANTS
WORKSHEET 4



Q1	If the area of a triangle with vertices $(-3, 0)$, $(3, 0)$ and $(0, k)$ is 9 sq units. Then the value of k will be (a) 9 (b) 3 (c) -9 (d) 6
Q2	If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$, then value of x is (a) 3 (b) ± 3 (c) ± 6 (d) 6
Q3	If $A = \begin{vmatrix} 2 & \lambda & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{vmatrix}$, then A^{-1} exists, if (a) $\lambda = 2$ (b) $\lambda \neq 2$ (c) $\lambda \neq -2$ (d) None of these
Q4	If A and B are matrices of order 3 and $ A = 5$, and $ B = 3$, then $ 3AB $ is equal to (a) 45 (b) 405 (c) 135 (d) None of these

Q 5	<p>If there are two values of 'a' which makes determinant,</p> $\begin{vmatrix} 1 & -2 & 5 \\ 2 & a & -1 \\ 0 & 4 & 2a \end{vmatrix} = 86,$ <p>then sum of these numbers is</p> <p>(a) 4 (b) -5 (c) -4 (d) 9</p>
Q 6	<p>If A is a square matrix of order 3, with $A = 9$, then the value of $2 \cdot \text{adj } A$</p> <p>(a) 648 (b) 54 (c) 72 (d) 108</p>
Q 7	<p>If A is a square matrix of order 2 and A, then value of $2 A A'$ is</p> <p>(a) 64 (b) 8 (c) 16 (d) 32</p>
Q 8	<p>If matrix $\begin{bmatrix} 2 & 3 & -1 \\ x + 4 & -1 & 2 \\ 3x + 1 & 2 & -1 \end{bmatrix}$ is a singular matrix, then the value of x is</p> <p>(a) $\frac{-3}{16}$ (b) $\frac{3}{16}$ (c) $\frac{4}{13}$ (d) $\frac{8}{10}$</p>

Q 9	<p>For matrix $A = \begin{bmatrix} 2 & 5 \\ -11 & 7 \end{bmatrix}$, $(adjA)'$ is equal to:</p> <p>(a) $\begin{bmatrix} -2 & -5 \\ 11 & 7 \end{bmatrix}$</p> <p>(b) $\begin{bmatrix} 7 & 5 \\ 11 & 2 \end{bmatrix}$</p> <p>(c) $\begin{bmatrix} 7 & 11 \\ -5 & 2 \end{bmatrix}$</p> <p>(d) $\begin{bmatrix} 7 & -5 \\ 11 & 2 \end{bmatrix}$</p>
Q10	<p>Given that $A = [a_{ij}]$ is a square matrix of order 3×3 and $A = -7$, then the value of $\sum_{i=1}^3 a_{i1} A_{i1}$, where A_{ij} denotes the cofactor of element a_{ij} is:</p> <p>(a) 7</p> <p>(b) -7</p> <p>(c) 0</p> <p>(d) 49</p>
Q11	<p>Given that A is a non-singular matrix of order 3 such that $A^2 = 2A$, then value of $2A$ is:</p> <p>(a) 4</p> <p>(b) 8</p> <p>(c) 64</p> <p>(d) 16</p>
Q12	<p>Let $A = \begin{vmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{vmatrix}$, where $0 \leq \theta \leq 2\pi$. Then</p> <p>(a) $\text{Det}(A) = 0$</p> <p>(b) $\text{Det}(A) \in (2, \infty)$</p>

	<p>(c) $\text{Det}(A) \in (2, 4)$</p> <p>(d) $\text{Det}(A) \in [2, 4]$</p>
Q13	<p>For the matrix $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$, $A^2 + aA + bI = O$, then the values of numbers a and b is</p> <p>(a) $a = 3, b = 2$</p> <p>(b) $a = 4, b = 3$</p> <p>(c) $a = -4, b = 1$</p> <p>(d) $a = -3, b = 2$</p>
Q14	<p>If A is an invertible matrix of order 3 and $A = 5$, then value $\text{adj } A$ is</p> <p>(a) 15</p> <p>(b) 45</p> <p>(c) 35</p> <p>(d) 25</p>
Q15	<p>If A is a singular matrix, then $A (\text{adj } A)$ is</p> <p>(a) Null matrix</p> <p>(b) Scalar matrix</p> <p>(c) Identity matrix</p> <p>(d) None of these</p>
Q16	<p>If A is 3×3 square matrix such that $A (\text{adj } A) = 2I$, where I is the identity matrix, The value of $\text{adj } A$ is</p> <p>(a) 4</p> <p>(b) -4</p> <p>(c) 0</p> <p>(d) none of these</p>

Q17	<p>If the value of a third order determinant is 12, then the value of the determinant formed by replacing each element by its cofactors will be</p> <p>(a) 12 (b) 144 (c) -12 (d) 13</p>
Q18	<p>If A is a square matrix of order 3×3 such that $A = 2$, then the value of $adj(adj A)$ is</p> <p>(a) -16 (b) 16 (c) 0 (d) 2</p>
Q19	<p>If A is a square matrix of order 3×3 such that $A = 4$, then the value of $A (adj A)$ is</p> <p>(a) 4 (b) 16 (c) 12 (d) 48</p>
Q20	<p>If A is a square symmetric matrix of order 3 then the value of A is</p> <p>(a) 0 (b) 3 (c) 9 (d) 27</p>
Q21	<p>If $A = \begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$, then $(adj A)$ is equal to</p> <p>(a) a^{27} (b) a^6 (c) a^9 (d) a^3</p>

Q22	<p>Let $A = \begin{bmatrix} 200 & 50 \\ 10 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 50 & 40 \\ 2 & 3 \end{bmatrix}$, then AB is equal to</p> <p>(a) 460 (b) 2000 (c) 3000 (d) -7000</p>
Q23	<p>The value of determinant $\begin{bmatrix} \cos 20^\circ & \sin 20^\circ \\ \sin 70^\circ & \cos 70^\circ \end{bmatrix}$ is</p> <p>(a) 1 (b) -1 (c) 0 (d) $\frac{1}{2}$</p>
Q24	<p>If A is a skew symmetric matrix of odd order n, then</p> <p>(a) $A = 0$ (b) $A = 1$ (c) $A = -1$ (d) None of these</p>
Q25	<p>The minors of the diagonal elements of the determinant $\begin{vmatrix} 3 & -1 & 2 \\ 4 & -1 & 3 \\ 2 & 0 & -1 \end{vmatrix}$ are</p> <p>(a) 1, 7, 1 (b) -1, 7, 1 (c) 1, -7, 1 (d) None of these</p>
Q26	<p>If $\Delta = \begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix}$, then the cofactor A_{21} is</p>

	<p>(a) $-(hc + fg)$</p> <p>(b) $fg - hc$</p> <p>(c) $fg + hc$</p> <p>(d) $hc - fg$</p>
Q27	<p>The matrix is $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & -1 & 0 \\ -7 & 2 & 1 \end{bmatrix}$ is</p> <p>(a) Singular matrix</p> <p>(b) Non - singular</p> <p>(c) Symmetric matrix</p> <p>(d) Skew symmetric matrix</p>
Q28	<p>The adjoint of the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ is</p> <p>(a) $\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$</p> <p>(b) $\begin{bmatrix} 4 & -3 \\ -2 & 1 \end{bmatrix}$</p> <p>(c) $\begin{bmatrix} 4 & -2 \\ -3 & -1 \end{bmatrix}$</p> <p>(d) $\begin{bmatrix} 4 & -2 \\ 1 & -3 \end{bmatrix}$</p>
Q29	<p>If $A = \begin{bmatrix} 1 & 4 \\ 3 & 15 \end{bmatrix}$, then A^{-1} is equal to</p> <p>(a) $\frac{-1}{3}$</p> <p>(b) $\frac{1}{3}$</p> <p>(c) $\frac{2}{3}$</p> <p>(d) $\frac{4}{3}$</p>

30	<p>If $A = \begin{bmatrix} 3 & 0 & -1 \\ 2 & 3 & 0 \\ 0 & 4 & 1 \end{bmatrix}$, then find $adj(adj(A))$</p> <p>(a)-1 (b)0 (c)1 (d)None of these</p>
<p>Case Study Based Question</p> <p>Two schools SWAMIVIVEKANANDA and SGRR wants to award their selected students on the basis of values of sincerity, truthfulness and helpfulness. SWAMIVIVEKANANDA wants award ₹x each, ₹y each and ₹z each for three respective values to 3, 2 and 1 students respectively with a total award money of ₹1600. SGRR wants to spend ₹2300 to award its 4,1,3 students on respective values (by giving the same amount to the three values as before). The total amount of the award for one prize on each is ₹900.</p> <p>Based on the given information, answer the following questions :</p>	
Q31	<p>The value $x + y + z$ is</p> <p>(a) 800 (b)900 (c)1000 (d)12000</p>
Q32	<p>The value of $4x + y + z$ is</p> <p>(a) 1600 (b) 1200 (c) 900 (d) 2300</p>
Q33	<p>The value of y is</p> <p>(a) 200 (b) 250 (c) 300</p>

	(d) 350
Q34	<p>The value of $2x + 3y$ is</p> <p>(a) 1000 (b) 1100 (c) 1200 (d) 1300</p>
Q35	<p>$Y - x$ is equal to</p> <p>(a) 100 (b) 200 (c) 300 (d) 400</p>
<p>Case Study Based question</p> <p>A factory produces three items every day. Their production on certain day is 45 Tons. It is found that the production of third item exceeds the production of first item by 8 tons while the total production of first and third item is twice the production of second item.</p> <p>Based on the given information, answer the following questions:</p>	
Q36	<p>If x, y, z respectively denotes the quantity (in tons) of first, second and third item produced, then which of the following is true?</p> <p>(a) $x + y + z = 45$ (b) $x + 8 = z$ (c) $x - 2y + z = 0$ (d) All of these</p>
Q37	<p>If $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & -2 \\ 1 & -1 & 1 \end{bmatrix}^{-1} = \frac{1}{6} \begin{bmatrix} 2 & 2 & 2 \\ 3 & 0 & -3 \\ 1 & -2 & 1 \end{bmatrix}$</p> <p>Then the inverse of $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & -1 \\ 1 & -2 & 1 \end{bmatrix}$ is</p>

$$(a). \begin{bmatrix} \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{2} & 0 & \frac{-1}{2} \\ \frac{1}{6} & \frac{-1}{3} & \frac{1}{6} \end{bmatrix}$$

$$(b). \begin{bmatrix} \frac{1}{3} & \frac{1}{2} & \frac{1}{6} \\ \frac{1}{3} & 0 & \frac{-1}{3} \\ \frac{1}{6} & \frac{-1}{3} & \frac{1}{6} \end{bmatrix}$$

$$(c). \begin{bmatrix} \frac{1}{2} & 0 & \frac{-1}{2} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{6} & \frac{-1}{3} & \frac{1}{6} \end{bmatrix}$$

D .None of these

Q38 $x : y : z$ is equal to

- (a) 12: 13 : 20
- (b) 11: 15: 19
- (c) 15: 19: 11
- (d) 13: 12: 20

Q39 Which of the following is not true?

- (a) $|adj A| = |A|^{n-1}$, where n is order of the matrix A
- (b) $(A')^{-1} = (A^{-1})'$
- (c) A is skew symmetric matrix of odd then $|A| = 0$

	(d) All above
Q40	<p>If a matrix B is both symmetric and skew symmetric, then B is equal to</p> <p>(a) 1 (b) -1 (c) 0 (d) None of these</p>
	<p style="text-align: center;">Case Study Based question</p> <p>Maresh wants to donate a rectangular plot of land for a school of her village. When she was asked by construction agency to give dimensions of the plot, she said that if its length(x) is decreased by 50m and breadth(y) is increased by 50m, then its area will remain same, but if length is decreased by 10m and breadth is decreased by 20m, then its area will be decrease by 5300 m².</p> <p>Based on above information answer the following questions:</p>
Q41	<p>The equations in terms of x and y are</p> <p>(a) $x - y = 50$, $2x - y = 550$ (b) $x - y = 100$, $2x + y = 550$ (c) $x + y = 50$, $2x + y = 550$ (d) $x + y = 50$, $2x - y = 550$</p>
Q42	<p>Which of the following matrix equation is represented by the given information?</p> <p>(a) $\begin{bmatrix} 1 & -1 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 50 \\ 550 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 50 \\ 550 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -50 \\ -550 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 1 \\ 2 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 50 \\ 550 \end{bmatrix}$</p>

Q43	The value of x (length of rectangular plot is (a)150m (b)400m (c) 200m (d)320m
Q44	The value of y (breadth of rectangular plot) is (a)150m (b)200m (c) 430m (d)350m
Q45	How much is the area of rectangular field? (a)60000sq. m (b)30000sq.m (c) 40000sq.m (d) 20000sq.m

ANSWERS

1.b 2.c 3.d 4.c 5.c 6.d 7.a 8.a 9.c 10.b 11.b 12.d 13.c 14.d
15.a 16.a 17.b 18.b 19.a 20.a 21.b 22.d 23.c 24.a 25.
26.b 27.b 28.a 29.b 30.c 31.b 32. D 33. C 34.d 35.a 36.d
37.c 38. B 39.d 40.c 41.b 42.a 43.c 44.a 45.b